How CRISPR works, according to its discoverers

The GLP aggregated and excerpted this blog/article to reflect the diversity of news, opinion and analysis.

At the American Society of Human Genetics meeting in October, CRISPR-Cas9 inventors Jennifer Doudna and Emmanuelle Charpentier accepted the Gruber Genetics Prize, then stopped by the press room. For me, this was a little like sitting down with Bono and Bruce Springsteen, but the women were wonderfully down-to-earth, and a little stunned at all the attention since they published their key paper in 2012 on the technique that is speeding gene editing and making genome editing possible. Below are their comments from their Gruber award acceptance speeches and visit to the press room in October.

Ricki Lewis: How Does CRISPR-Cas9 Work? The short version, that is.

Charpentier: The enzyme Cas9, an endonuclease, is programmed with a guide RNA to target and cleave a specific DNA sequence at two strands. The manipulator just needs to engineer the guide RNA according to the sequence of the gene to be modified.

Doudna: Bacteria defend against viral infection by acquiring little bits of DNA from viruses into their genomes, making RNA copies of viral sequences, and incorporating them into one or more proteins used to target the viral DNA. Then the RNA-protein complex finds double-stranded regions, unwinds them, and positions itself so two active sites can cut the double-stranded DNA at a precise, targeted sequence. Cells recognize double strand breaks and repair them using two pathways that add new sequence or heal the old. It is a remarkable molecular machine that can search through large slots of DNA to find a particular sequence.

Read full, original post: A Conversation with Crispr-Cas9 Inventors Charpentier and Doudna